

Patent claims

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1. A process for the preparation of tungsten carbides by gas phase carburization of tungsten powders and/or suitable tungsten precursor compound powders at temperatures above 850°C, characterised in that the carburizing gas phase used is a CO₂/CO mixture with a CO₂ content which is above the Boudouard equilibrium content corresponding to the carburization temperature.
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2. A process according to claim 1, characterised in that carburization is carried out with a carbon activity from 0.4 to 0.9.
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3. A process according to claim 1 or 2, characterised in that the carburization temperature is 900 °C to 950 °C.
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4. A process according to any one of claims 1 to 3, characterised in that carburization is carried out at carburization temperature over a period from 4 to 10 hours.
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5. A process according to any one of claims 1 to 4, characterised in that the precursor compound used is tungsten oxide powder.
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6. A process according to any one of claims 1 to 5, characterised in that the tungsten carbides undergo a heat treatment at 1,150°C to 1,800 °C after carburization.
7. Tungsten carbide, characterised by a relationship between coherence length x and lattice strain y according to the formula
- $$y < (-4.45 \cdot 10^{-4} \text{ nm}^{-1} \cdot x + 0.113) \%$$
8. Tungsten carbide according to claim 8, wherein coherence length x and lattice strain y fulfil the following conditions:

$$y < (-2.5 \cdot 10^{-4} \text{ nm}^{-1} \cdot x + 0.1025)\% \text{ and}$$

$$y < (-7.78 \cdot 10^{-4} \text{ nm}^{-1} \cdot x + 0.1395)\%.$$

- 5 9. Sintered parts prepared from tungsten carbides according to any one of claims 1 to 8.

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